

Calculator Worksheet

For each of these exercises, describe on a separate sheet of paper, how you used the calculator to solve the problem. Describe the window that you used to analyze the graph (e.g. $[-4, 4] \times [-2, 10]$, meaning the screen showed x from -4 to 4 , and y from -2 to 10).

Make your answers as clear and complete as you can.

1. Graph $y = x^3 - 5x + 15$. What is a good window to be able to look closely at the curve's vertex? Using the machine, what are the coordinates of the vertex? What is the slope of the curve at $x = -2$?

2. Graph $y = x \cos(x^2)$. Is there a local minimum or a local maximum between $x = -3$ and $x = -2$? If so, which, and what are the coordinates?

3. At what values of x , does $y = \cos^2 x + \sin^2 x$ have a local maximum or minimum? What is the value of the function at $x = 7.6$?

4. Plot the derivative of $f(x) = \frac{x}{x^2 - 1}$. On the interval $[-4, 4]$, where is f increasing and where is f decreasing? Using the graph of f' , determine where f has a maximum or minimum. Which is it and how did you analyze f' to make this determination?

6. Does the equation $\cos x = 5x^2 - 8x^4$ have any solutions? If so what are they? (Hint: there are two ways to approach this problem. You can 1) enter two functions as y_1 and y_2 and find their intersection(s), 2) enter one function as the difference of the two expressions and determine its zero(es).

7. Plot $f(\theta) = \sec \theta + \csc \theta$ on the interval $0 \leq \theta \leq 2\pi$. How many solutions to the equation $f'(\theta) = 0$ are there on this interval?